HERMAN Michel

February 2016

Curriculum vitae

RESEARCH ACTIVITIES

*For an overview of the full CV and the list of publications, see **short CV** and **List of publications** files, respectively, on http://www.ulb.ac.be/cpm/people/scientists/mherman/main.html.*

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1. PhD theses supervision

• "Etude spectroscopique d'une transition électronique impliquant une variation de la géométrie moléculaire : la transition A-X de C_2H_2"
Van Craen J.C. –Sciences, Chemistry - 1983, codirection with Prof. R. Colin
• "Etude spectroscopique à très haute résolution des molecules NO_2 et trans-$C_2H_2O_2$. Contribution à la spectroscopie de double résonance laser"
Vander Auwera, J. –Sciences, Chemistry – 1987
• "Etude par spectroscopie laser optogalvanique et optoacoustique du système chimique NO, NO_2 et N_2O_4"
Van Roozendael, M. –Sciences, Chemistry - 1989
• "Etude par spectroscopie laser sub Doppler des molécules HNO_3 et CH_3CHO dans le domaine de l'infrarouge"
Kleiner, I. –Sciences, Chemistry – 1989, codirection with Dr. M. Godefroid. ("Solvay Awards")
• "Etude spectroscopique des premiers états de valence de la molécule d'acétylène"
Huet, T. –Sciences, Physics – 1990
• "Spectroscopie électronique de molécules organiques : le trans-glyoxal et le 1,2,4-trifluorobenzène. Construction d'un jet supersonique"
Vanhorenbeke, F. –Sciences, Chemistry – 1990
• "Etude par spectroscopie à Transformée de Fourier du spectre infrarouge de HNO_2"
Guilmot, J.M. –Sciences, Chemistry – 1993
• "Etude d'intensités spectrales dans des molécules d'intérêt atmosphérique"
Hurtmans, D. –Sciences, Physics – 1995; codirection with Dr. J. Vander Auwera
• "High resolution spectroscopy and intramolecular dynamics in acetylene"
Abbouti Temsamani, M. –Sciences, Chemistry – 1996
• "Etude spectroscopique expérimentale et théorique, des molécules N_2O_4 et 1,2-$C_2H_4Cl_2$"
El Youssoufi, Y. –Sciences, Chemistry - 1998; codirection with Dr. J. Liévin
• "Etudes spectroscopiques des molécules C_2H_2, HCOOH et CH_3CHO fortement excitées vibrationnellement : développements instrumentaux laser, réactivité intramoléculaire et effets de pression"
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-08312007-160712/
Herregodts, F. – Sciences, Chemistry – 2000
• "Etude spectroscopique des niveaux de vibration hautement excités des molécules N_2O et C_2H_4 : Analyses rotationnelles et modèles globaux"
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-08312007-160712/
Bach, M. – Sciences, Physics – 2001
• "Spectroscopie infrarouge à haute résolution de molécules aromatiques : le pyrrole (C_4H_5N) et le furane (C_4H_4O) "
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-08312007-160712/
Mellouki, A. – Sciences, Physics – 2001
• "L'état électronique fondamental de l'acétylène"

http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-08312007-160712/
El Idrissi, I. – Sciences, Physics – 2001
• "Spectrométrie ultrasensible par transformée de Fourier couplée à un montage laser intracavité : application à l'étude des niveaux de vibration-rotation de l'acétylène"
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-07032005-030724/
Depiesse C. – Sciences, Physics – 2005
• "High resolution infrared spectroscopy : setting up an experiment to investigate small clusters "
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-11102008-164137/
Didriche, K. – Sciences, Chemistry – 2008
• "Description globale de la structure de vibration-rotation de la molécule l'acétylène"
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-06082009-211829/
Robert, S. – Sciences, Physics – 2009
• "Etude expérimentale et théorique du processus de nucléation de petits hydrocarbures"
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-02272012-120944/
Lauzin, C. – Sciences, Chemistry – 2012 ; codirection with Prof. J. Liévin
• "Le modèle global de l'acétylène: Applications spectroscopiques, dynamiques et astrophysiques "
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-03152012-102543/
Amyay, B. – Sciences, Physics – 2012
• " Instrumental contribution to FTIR spectroscopy using a femto-OPO laser source and cavity enhanced absorption "
http://theses.ulb.ac.be/ETD-db/collection/available/ULBetd-10162012-102714/
de Ghellinck d'Elseghem Vaernewijck, X. - Applied Sciences, Physics – 2012

• « High resolution FTIR spectroscopy using a femto-OPO laser source and cavity enhanced absorption »
Golebiowski, D. –Sciences, Chemistry – 2015

• **Vanfleteren, T.** –Sciences, Chemistry – running

Five of these past PhD students are today on academic positions in Belgium (Dr. J. Vander Auwera, FNRS-ULB, Dr. M. Van Roozendael, IASB, and Dr. C. Lauzin, UCLouvain) and In France (Prof. T. Huet, Lille and Dr. I. Kleiner, CNRS-Paris Est).

2. Licence/master theses supervision

• Spectroscopie à haute résolution de la molécule C_2HD
Abbouti Temsamani M.
Sciences, Chimie (1990)
• Etude du spectre infrarouge de N_2O_4
Pokorni F.
Sciences, Chimie (1991)
• Etude par spectroscopie infrarouge de la molécule HONO
Dejardin P.
Sciences Appliquées (1992)
• Etude du cluster $3\nu_3$ de C_2H_2
Jans P.
Sciences, Physique (1994)
• Etude par spectrométrie de transformée de Fourier du méthane : mise au point d'un système en jet supersonique à fente

Palma C.
Erasmus Grenoble, Physique (1995)
• Etude de forme de raies par spectroscopie laser via l'espace des transformées de Fourier
Van Der Vorst D.
Sciences, Physique (1995)

• Etude en jet supersonique des vibrations colorées de C_2H_4
Jurisic V.
Erasmus Lille, Physique (1996)
• Spectroscopie à haute résolution spectrale dans le domaine de l'infrarouge proche : Aspects expérimentaux et informatiques
Desmedt, I.
• Sciences appliquées (2001)
Etude spectroscopique du dimère de l'acide formique
Deroo, S.
Sciences, Chimie (2002)
• Spectroscopie par transformée de Fourier couplée à un module d'absorption intracavité laser : observation ultrasensible de vibrations colorées dans $^{12}C^{13}CH_2$
Robert, S.
Faculté des Sciences, Physique (2004)
• Spectroscopie par transformée de Fourier en jet supersonique : application aux isomères de spin de $^{12}CH_4$ et du $^{12}C_2H_2$
Baire, Q.
Sciences, Physique (2006)
• Simulation de spectres infrarouges de $^{12}C_2H_2$ d'intérêt astrophysique
Progneaux, A.
Sciences Appliquées, Physique (2006)
• Spectroscopie par transformée de Fourier en jet supersonique appliquée à N_2O : Comparaison des performances de deux montages instrumentaux
Maj, M.
Sciences, Chimie (2006)
• Le modèle global appliqué à la structure des niveaux d'énergie de $^{12}C_2H_2$: les aspects vibrationnels
Ferrich, Y.
Sciences, Chimie (2006)
• Simulations spectrales d'intérêt astrophysique: Le spectre infrarouge de $^{12}C_2H_2$
Amyay, B.
Sciences, Physique (2007)
• Application de la spectroscopie laser ultrasensible en jet supersonique à l'étude de petits agrégats d'acétylène.
de Ghellinck d'Elseghem Vaernewijck, X.
Ecole Polytechnique de Bruxelles, Ingénieur Physicien (2008)
• Etude à haute resolution spectrale de la bande $\nu_1+\nu_3$ du dimère d'acétylène, $(C_2H_2)_2$
Golebiowski, D.
Faculté des Sciences, Chimie (2012)
• Etude par spectroscopie à haute résolution de la bande $\nu_1+\nu_3$ du complexe de van der Waals

ammoniac-argon, Ar-NH_3

Vanfleteren, T.

Faculté des Sciences, Chimie (2013)

3. Member of PhD and Habilitation theses committees out of ULB (2000-)

- Dr. X. Chillier
  Université de Lyon I
  Habilitation – 2000
- Mr. D. Collet
  Université de Lille I
  PhD – 2000
- Mr. S. Kassi
  Université de Lille I
  PhD – 2000
- Mr. O. Robert
  Université de Bourgogne
  PhD – 2000
- Mrs. G. Weirauch
  Université Fourier de Grenoble
  PhD – 2002
- Mrs. C. Vigouroux
  Université Catholique de Louvain
  PhD – 2002
- Mr. A. Bonnamy
  Université de Rennes
  PhD – 2002
- Dr. V. Boudon
  Université de Bourgogne
  Habilitation – 2004
- Mr. C. Lerot
  FUNDP, Namur
  PhD – 2005
- Mrs. A. Hansson
  Stockholm university
  PhD ("opponent") - 2005
- Mrs . F. Gueye
  Université de Paris Sud
  PhD – 2005
- Dr. Q. Kou
  Université de ¨Paris Sud »
  Habilitation – 2005
- Dr. R. Georges
  Université de Rennes
  Habilitation– 2005
- Mr. J. Thiévin
  Université de Rennes
  PhD – 2007
- Dr. P. Asselin
  Université de Paris VI
  Habilitation – 2007
- Dr. S. Kassi
  Université Fourier de Grenoble
  Habilitation – 2008
- Dr. L. Margulès
  Université de Lille 1
  Habilitation – 2008
- Mr. T. Foldës
  University of Bratislava
  PhD – 2009
- Mr. J. Mandon
  Université de Paris-Sud
  PhD – 2009
- Mrs. M. Cirtog
  Université de Paris VI
  PhD – 2011
- Mr. V. Sironneau
  Université de Paris-Est
  PhD – 2011
- Mr. P. Kongolo
  FUNDP, Namur
  PhD – 2012
- Dr. A. Jolly
  Université de Paris-Est
  Habilitation – 2012
- Dr. S. Boyé-Péronne
  Université de Paris Sud
  Habilitation – 2013
- Mr. V. Roussel
  Université de Rennes
  PhD – 2013
- Mr. N. Suas-David
  Université de Rennes
  PhD – 2016

Member of 17 such committees prior to 2000.

4. Organisation of international conferences (2000-)

- PI for the international summer school on "Spectroscopy of Highly Excited States" (http://www.chem.uni-wuppertal.de/sphers/ssprog.html), Han-sur-Lesse, 16-20 September 2003
- PI for the international summer school on "Quantitative Spectroscopy for Atmospheric and Astrophysical Research » (http://www.chem.uni-wuppertal.de/quasaar/han-sur-lesse/) Han-Sur-Lesse-Belgium (April 2007).
- PI (with R.J. Saykally-Berkeley) for the workshop of the Solvay Institutes on « Molecular complexes in the atmosphere and beyond » (http://www.solvayinstitutes.be/Activities/01_Archives/ATMOS/Complexes.html) Brussels, 20-23 April 2010 .
- PI for the workshop of the Solvay Institutes on « Femto-astro-spectro ethyne (*fase*)» (http://www.solvayinstitutes.be/events/FASE/fase.html) Brussels, 2-5 May 2012
- Member (with M. Quack/ETH Zurich and P. De Natale/LENS Firenze) of the executive committee of the "Colloquium on High resolution molecular Spectroscopy (HRMS)", the largest conference in the field in Europe, held every 2 years in Europe (2007-) (see http://lmsd.chem.elte.hu/hrms/ for 2013); now *chair* of this committee (2013-).
- PI (with T. Softley-Oxford and N. Vaeck-Brussels) for the workshop of the Solvay Institutes on « Atomic and Molecular Collision Mechanisms » http://www.solvayinstitutes.be/event/workshop/acme_2015/acme_2015.html Brussels, March 30 – April 2, 2015.

5. Major memberships in scientific committees (2000-)

- "Conseil Scientifique du Labex CaPPA", Université de Lille, France (2013-)
- Peer review committee of the SOLEIL synchrotron, section dilute media (2012-)
- Scientific committee of the LEFE/CHAT program, INSU/CNRS (2011-2013)
- "Conseil scientifique" of the « Institut d'aéronomie spatiale de Belgique » (2009-)
- Editorial board of "Molecular Physics" (2008-)
- President of the scientific evaluation committee CNRS/AERES of the "Laboratoire de physique moléculaire pour l'atmosphère et l'astrophysique" (Paris VI) (2008)
- Executive committee (1 out of 3 people) of the "Colloquium on High Resolution Molecular Spectroscopy" (largest conference in the field in Europe) (2007-), and *chair* since 2013
- Scientific committee of the "Journées de Spectroscopie Moléculaire", France (1997-2007)
- President of the "Chimie Physique et Théorique" division of the "Société Royale de Chimie" - Belgium (1998-2007)
- Secretary of the "Fonds Emile Defay" (2005-)
- Scientific committee E4 (Fysicochemie) of the "Nationaal Fonds voor Wetenschappelijk Onderzoek" (1997-2005)
- Scientific committee of the "Ohio State University International Symposium on Molecular Spectroscopy" (1999-2002)
- CNRS/AERES evaluation committee of the "Laboratoire de Dynamique, Interaction et Réactivité" (Paris VI) (2000 and 2012)
- AERES evaluation committee of the "Laboratoire Interuniversitaire des Systèmes Atmosphériques » (Paris VII) (2013)
- Scientific committee of the "Colloquium on High Resolution Molecular Spectroscopy" (1995-)

6. Invited plenary talks at international meetings (2000-)

- *M. Herman*, "Illustrating High Resolution Vibration-Rotation Band Shapes; From Molecular Structure To Intramolecular Reactivity", 16th International Conference on High Resolution Spectroscopy, Prague, Czech Republic. – 2000.
- *M. Herman*, "The Acetylene Saga", International workshop on "Wide-Amplitude Rovibrational Bound States in Polyatomic Molecules", organised by the UK Collaborative Computational Project on Molecular Quantum Dynamics, Manchester, UK. – 2001.
- *M. Herman*, "Recent Developments in Fourier Transform Techniques", 59th International Symposium on Molecular Spectroscopy, Ohio, USA. – 2004.
- *M. Herman*, "Focus on overtone spectra of acetylene dimers"; Solvay workshop on "Molecular complexes in our atmosphere and beyond", Brussels-Belgium - 2010.
- *M. Herman*, "Anharmonic resonances"; International conference on vibrational anharmonicity, Marne la Vallée - France, 2012.
- *M. Herman*, "ACETYLENE"; Solvay workshop on "Femto-, astro-, spectro-ethyne", Brussels-Belgium - 2012.
- *M. Herman*, "Overtone spectroscopy of acetylene containing dimers",2nd international workshop on 'Spectroscopic signatures of molecular complexes/ions in our atmosphere and beyond", Varanasi - India, 2012.
- *M. Herman,* "The Femto-, Astro-, Spectro-Ethyne (FASE) database", "Opacities in cool stars and planets", Windsor – England, 2012.
- *M. Herman,* "How well do H-bonded complexes survive in their vibrational overtones?", XXth international conference on horizons in hydrogen bond research", Antwerp– Belgium, 2013.
- *M. Herman,* "High resolution overtone spectroscopy of bound and weakly bound molecules", 23rd International Conference on High Resolution Spectroscopy, Bologna, Italy, 2014.
- *M. Herman*, "Resonance mechanisms in weakly bound species"; Solvay workshop on "Atomic and molecular collision mechanisms", Brussels-Belgium, 2015.
- *M. Herman,* "High resolution overtone spectroscopy in water containing molecular complexes"; International conference on vibrational anharmonicity, Madrid - Spain, 2015.

2 additional invitations were turned down in 2011 (from the National association of the Canadian Physicists and the Optical Society of America), 1 in 2013 (from the Optical Society of America), 2 in 2015 (from the 12th meeting on spectroscopy and dynamics of molecules and clusters, India; and from the Optical Society of America), and 1 in 2014 (from the Fourier Transform Spectroscopy Topical Meeting), for agenda and/or financial reasons.

7. Seminars abroad (2003-)

- "High Resolution Spectroscopy of Formic Acid" (Bologna, 2003)
- "Molecular Vibration: The Quantum vs. Statistical Challenge" (Bologna, 2004)
- "Recent Developments in High Resolution Fourier Transform Spectroscopy" (Aachen, 2005)
- "Recent Developments in High Resolution Fourier Transform Spectroscopy" (Taiwan 2005 – Triple conference)
- "Recent Developments in High Resolution Fourier Transform Spectroscopy" (Sydney, 2005)
- "Recent Developments in High Resolution Fourier Transform Spectroscopy" (Melbourne, 2005)
- "Zauli lecture" (Bologna, 2005)
- "The new supersonic expansion at ULB" (Bologna, 2006)
- "The acetylene saga : from spectro to astro through femto and nano" (Ottawa, 2007)
- "Applications en planétologie et en astrophysique de l'étude fondamentale des harmoniques vibrationnels" (Paris VII, 2008)
- " From Spectro to Astro, through Femto and Nano " (Zurich, 2008)

- "High resolution overtone spectra of acetylene in supersonic expansions: from monomers to aggregates" (Bologna, 2008)
- " Vibrational alchemy: from spectro to astro, through femto and nano" (Edmonton, 2009)
- " Vibrational alchemy: from spectro to astro, through femto and nano" (Lethbridge, 2009)
- " Vibrational alchemy: from spectro to astro, through femto and nano" (Madison, 2009)
- " Vibrational alchemy: from spectro to astro, through femto and nano" (Akron, 2009)
- " Near infrared investigation of acetylene van der Waals complexes" (Akron, 2010)
- " A four-atom molecule at the fore-front of gas phase spectroscopy, intramolecular dynamics and astrochemistry: State-of-the-art acetylene" (Bologna, 2010)
- "Overtone spectroscopy of the acetylene dimer" (Bologna, 2011)
- "The femto-, astro-, spectro-ethyne (FASE) database (Bologna 2013)
- "Vibrational alchemy" (Venice 2013)
- "Sensitive detection using FTIR and lasers: Investigation of jet-cooled molecules" (Florence, 2013)
- "High-resolution overtone spectroscopy of van der Waals complexes" (Perugia, 2013)
- "High-resolution overtone spectroscopy of ammonia containing van der Waals complexes" (Bologna 2015)
- "High-resolution overtone spectroscopy of water containing van der Waals complexes" (Paris VI, 2015)
- "A challenging journey in high-resolution infrared laboratory spectroscopy" (Cologne, 2015)
- "High resolution overtone spectroscopy and dynamics of small molecules: trends and challenges" (Zürich 2015)

8. Recent regular participation at international meetings

6a. Oral contributions (2000-)

(Name underlined when making the presentation)

2002

57th Ohio State University International Symposium on Molecular Spectroscopy, Columbus (USA)

- "Vibrational spectroscopic database on acetylene, $\tilde{X}\,^1\Sigma_g^+$ ($^{12}C_2H_2$, $^{12}C_2D_2$ and $^{13}C_2D_2$)", M. Herman, A. Campargue, M. I. El Idrissi, and J. Vander Auwera.
- "Overtone spectroscopy of formic acid", M. Freytes, D. Hurtmans, S. Kassi, J. Liévin, J. Vander Auwera, A. Campargue, and M. Herman.
- "The ν_7 and ν_9 bands of trans-formic acid studied using Fourier transform infrared spectra and submillimeter wave measurements", A. Perrin, J.-M. Flaud, J. Vander Auwera, M. Herman, O. Baskakov, S. V. Sirota, J. Demaison, and B. Bakri.

2004

59th Symposium on Molecular Spectroscopy, Columbus

- "Instrumental and theoretical investigation towards a global vibration-rotation model in 4-atom species : $^{12}C_2HD$ and $^{12}C^{13}CH_2$", M. Herman, C. Depiesse, D. Hurtmans, S. Kassi, S. Robert, J. Vander Auwera, G. Di Lonardo, L. Fusina, F. Tamassia and A. Fayt.
- "The vibrational spectrum of the dimer of formic acid in the gas phase : Room temperature and jet-cooled FT data", R. Georges, M. Freytes, D. Hurtmans, I. Kleiner, J. Vander Auwera and M.

Herman.

2007

62nd Symposium on Molecular Spectroscopy, Columbus

- "Global Vibration-Rotation Analysis in Acetylene $^{12}CH^{13}CH$", S. Robert, M. Herman, A. Fayt, G. Di Lonardo, L. Fusina and F. Tamassia.
- "Global Vibration-Rotation Analysis in Acetylene : $^{12}C_2H_2$", S. Robert, M. Herman and A. Fayt.
- "Description of the Fantasio Instrumental Set-up", K. Didriche, P. Macko and M. Herman.

2009

64th Symposium on Molecular Spectroscopy, Columbus

- " Status on the global vibration-rotation model in acetylene", B. Amyay, M. Herman, and A. Fayt.
- "The Fantasio set-up: description and extension towards Femto-Fantasio", K.. Didriche, C. Lauzin, X. de Ghellinck, P. Macko, A. Rizopoulos, P. Van Poucke, M. Herman, and S. Kassi
- "The Fantasio set-up: High resolution overtone spectroscopy of acetylene containing van der Waals dimers", C. Lauzin, J. Demaison, K. Didriche, P. Macko, J. Lievin, M. Herman, A. Perrin, and W.J. Lafferty.

2010

Atelier clathrates, Besançon, France

- "High resolution and high sensitivity IR detection of small aggregates containing acetylene in supersonic expansions: towards hydrates?", M. Herman and K. Didriche.

65th Symposium on Molecular Spectroscopy, Columbus

- "Rotational dependence of intramolecular dynamics in acetylene at low vibrational excitation as deduced from high resolution spectroscopy", D. S. Perry, A. Miller, B. Amyay, A. Fayt, and M. Herman.
- " Global modelling of high resolution IR spectra of $^{12}C_2H_2$", B. Amyay, M. Herman, and A. Fayt.
- "Investigation of van der Waals complexes in a free expansion of C_2H_2/X (X=noble gas) using CW cavity ring-down spectroscopy in the overtone range", C. Lauzin, K. Didriche, T. Földes and M. Herman.
- "Femto-FANTASIO: a versatile experimental set-up to investigate molecular complexes", K. Didriche, C. Lauzin, X. de Ghellinck, T. Földes, and M. Herman.

2011

Fifth Workshop on Titan Chemistry- Observations, Experiments, Computations, and Modeling, Hawai

- "Infrared spectroscopy of a acetylene complexes relevant to Titan's atmosphere", K. Didriche, C. Lauzin, T. Földes and M. Herman.

66th Symposium on Molecular Spectroscopy, Columbus

- "High resolution overtone spectroscopy of acetylene van der Waals complexes", K. Didriche, C. Lauzin, T. Földes, X. de Ghellinck, and M. Herman.
- "High resolution overtone spectroscopy of the acetylene van der Waals dimer", K. Didriche, C. Lauzin, T. Földes, D. Golebiowski, and M. Herman.
- "*High resolution spectroscopy and preliminary global analysis of CH stretching vibrations of C_2H_4 in the 3000 and 6000 cm^{-1} regions*"; M.A. Lorono Gonzales, V. Boudon, M. Loëte, M. Rotger, M.T. Bourgeois, K. Didriche, M. Herman, V.A. Kapitanov, Yu N. Ponomarev, A.A. Solodov, A.M. Solodov, T.M. Petrova, V.E. Zuev and S.B. Ras.
- "*Phase space exploration of acetylene at energies up to 13000 cm^{-1}*"; D.S. Perry, J. Martens, M. Herman and B. Amyay.

- "*Acetylene dynamics at energies up to 13000 cm^{-1}*"; J. Martens, D.S. Perry, M. Herman and B. Amyay.
- "*The high resolution spectrum of the Ar-C_2H_2 complex*"; C. Lauzin, K. Didriche, M. Herman and L. Coudert.

2016

71st International Sylposium on Molecular Spectroscopy, Urbana-Champaign

- "2OH overtone spectroscopy of water-containing van der Waals complexes", T. Vanfleteren, T. Földes, M. Herman, J. Liévin, J. Loreau and L.H. Coudert

6b. Poster presentations (2005-)

2005

Colloquium on High Resolution Molecular Spectroscopy, Salamanca, Spain

- "The low energy spectrum of acetylene $^{12}C_2H_2$: measurements and theoretical treatment", M. Lepère, J. Walrand, G. Blanquet, A. Fayt, G. Di Lonardo, L. Fusina, J.-P. Bouanich, S. Robert, J. Vander Auwera and M. Herman.
- "The FT absorption spectrum of $^{12}C_{13}CH_2$", E. Canè, L. Fusina, G. Di Lonardo, F. Tamassia, A. Fayt, S. Robert, M. Herman and J. Vander Auwera.
- "Fourier-transform jet spectroscopy", K. Didriche and M. Herman.
- "Retrieval of absolute line intensities from Fourier transform intracavity laser absorption spectroscopy", P. Macko and M. Herman.

2006

19th International Conference on High Resolution Molecular Spectroscopy, Prague, Czech Republic

- "The vibration-rotation energy pattern in acetylene : $^{13}C^{12}H_2$", A. Fayt, S. Robert, G. Di Lonardo, L. Fusina, F. Tamassia and M. Herman.

20th Colloquium on High Resolution Molecular Spectroscopy, Dijon (France), September 2007

- "The FT absorption spectrum of $^{13}CH^{12}CH$ in the 6750 – 9500 cm^{-1} region", L. Fusina, F. Tamassia, G. Di Lonardo, A. Fayt, S. Robert, M. Herman and J. Vander Auwera.
- "Analysis of the slit-jet Fourier spectrum of ethylene near 3000 cm^{-1} region, using tensorial formalism" M. Lorono, M. Rotger, V. Boudon, K. Didriche, M. Herman, and D. Bermejo
- "Global vibration-rotation anamuysis in acetylene, $^{12}C_2H_2$ and astrophysical applications", S. Robert, B. Amyay, M. Herman, and A. Fayt.
- "Building the Fantasio instrumental set-up: from lineshapes to clusters", K. Didriche, P. Macko, and M. Herman
- "Rotational spectrum and structure of asymmetric dinitrogen trioxide, N_2O_3", J. Demaison, M. Herman, J. Liévin, L. Margulès, and H. Möllendal.
- "High resolution spectroscopy of the 2CH band in the $^{12}C_2H_2$-Ar complex", P. Macko, C. Lauzin, and M. Herman.

2007

20th Colloquium on High Resolution Molecular Spectroscopy, Dijon (France), September 2007

- "The FT absorption spectrum of $^{13}CH^{12}CH$ in the 6750 – 9500 cm^{-1} region", L. Fusina, F. Tamassia, G. Di Lonardo, A. Fayt, S. Robert, M. Herman and J. Vander Auwera.
- "Analysis of the slit-jet Fourier spectrum of ethylene near 3000 cm^{-1} region, using tensorial formalism" M. Lorono, M. Rotger, V. Boudon, K. Didriche, M. Herman, and D. Bermejo

- "Global vibration-rotation analysis in acetylene, $^{12}C_2H_2$ and astrophysical applications", S. Robert, B. Amyay, M. Herman, and A. Fayt
- "Building the Fantasio instrumental set-up: from lineshapes to clusters", K. Didriche, P. Macko, and M. Herman
- "Rotational spectrum and structure of asymmetric dinitrogen trioxide, N_2O_3", J. Demaison, M. Herman, J. Liévin, L. Margulès, and H. Möllendal
- "High resolution spectroscopy of the 2CH band in the $^{12}C_2H_2$-Ar complex", P. Macko, C. Lauzin, and M. Herman.

2008

20th International Conference on High Resolution, Molecular Spectroscopy, Prague Czech Republic

- "Measured integrated band intensities and simulated line by line spectra for $^{12}C_2HD$ between 25 and 2.5 μm, and new global vibration-rotation parameters", S. Robert, M. Herman, A. Jolly, Y. Benilan, E. Cané, L. Fusina, F. Tamassia, and A. Fayt.

2009

21st Colloquium on High Resolution Molecular Spectroscopy, Naples, Italy

- "The Fantasio set-up: description and extension towards Femto-Fantasio", K. Didriche, C. Lauzin, X. de Ghellinck, P. Macko, A. Rizopoulos, P. Van Poucke, M. Herman, and S. Kassi.
- "Vibration-rotation pattern in acetylene: Introduction of Coriolis coupling in the global model and analysis of emission spectra of hot acetylene around 3 microns.", B. Amyay, S. Robert, M. Herman, A. Fayt, B. Raghavendra, A. Moudens, J. Thiévin, B. Rowe and R. Georges.
- "Investigation of the C_2H_2-CO_2 van der Waals complex in the overtone range using CW-CRDS", C. Lauzin, K. Didriche, J. Lievin, M. Herman and A. Perrin.
- "Measurement and analysis of high resolution absorption spectra of C_2H_4 near 1.6 microns.", M.A. Lorono Gonzales, M. Rotger, V. Boudon, K. Didriche, M. Herman, V.A. Kapitanov, Yu N. Pomonarev, A.A. Solodov, A.M. Solodov, T.M. Petrova.
- " The vibration-rotation energy pattern in acetylene: $^{13}CH^{12}CH$ up to 10 120 cm^{-1}", S. Robert, B. Amyay, A. Fayt, G. Di Lonardo, L. Fusina, F. Tamassia, and M. Herman.

2010

Molecular complexes in our atmosphere and beyond, Solvay Institutes, Brussels, Belgium

- « Experimental investigation of acetylene-containing van der Waals complexes: Improvements of the Brussels set-up» K. Didriche, C. Lauzin, X. de Ghellinck, T. Földes, and M. Herman.

2011

22nd Colloquium on High Resolution Molecular Spectroscopy, Dijon, France

- "Spectra of weakly bound acetylene containing complexes recorded by the FANTASIO set-up ", T. Földes, K. Didriche, C. Lauzin and M. Herman.
- "The infrared spectrum of propyne in the range 6200-6700 cm^{-1}"; M. Villa, L. Fusina, G. Nivellini, K. Didriche and M. Herman.
- "High resolution overtone spectroscopy of $(C_2H_2)_2$, $(C_2D_2)_2$ and $(C_2H_2$-$C_2D_2)$ van der Waals dimers" C. Lauzin, K. Didriche, T. Földes, D. Golebiowski,, M. Herman, C. Leforestier, N. Moazzen-Ahmadi, and A.R.W. McKellar.
- "High resolution spectroscopy of C_2H_2-Ne/Ar/Kr van der Waals complexes", C. Lauzin, K. Didriche, T. Földes, J. Liévin, E. Cauet, M. Herman, L. Coudert.
- "Accurate partition function for acetylene, $^{12}C_2H_2$, and related thermodynamical quantities", B. Amyay, A. Fayt and M. Herman.

2012

Femto-, Astro-, Spectro- Ethyne (FASE), Solvay Institutes, Brussels, Belgium

- "The Infrared Spectrum of $^{13}C_2H_2$: the Bending States up to $v_4 + v_5 = 4$", L. Fusina, G. Di Lonardo, A. Predoi-Cross and M. Herman
- "High temperature spectroscopy of ethyne and stellar spectra modeling", A. Gardez, B. Amyay, R. Georges, L. Biennier, B. Plez, A. Fayt, and M. Herman
- "C_2H_2-H_2O and C_2H_2-D_2O van der Waals dimer spectra in the 2CH range using the Brussels FANTASIO+ setup ", T.Földes, K.Didiriche, C. Lauzin, D. Golebiowski and M. Herman
- "High resolution spectroscopy of C_2H_2-Rg van der Waals complexes", C. Lauzin, K. Didriche, T. Földes, J. Liévin, E. Cauët, M. Herman, and L. H. Coudert,
- "Femto-Fantasio", X. de Ghellinck d'Elseghem Vaernewijck, D. Golebiowski and M. Herman

PAMO, Metz, France

- "The femto-Fantasio experimental set-up: description and new results in a static cell and around a supersonic expansion", D. Golebiowski, X. de Ghellinck d'Elseghem Vaernewijck, M. Herman and A. Fayt

Symposium on high resolution molecular spectroscopy, Zelenogorsk, Russia

- "Effects of large amplitude motion at increasing energy", D.S. Perry and M. Herman

2013

23rd Colloquium on High Resolution Molecular Spectroscopy, Budapest, Hungary

- "A high-resolution database for the vibration-rotation spectrum of acetylene (0-8022 cm^{-1})", B. Amyay, A. Fayt, R. Georges, M. Herman and J. Vander Auwera
- "Femto-FT-CEAS experiments", D. Golebiowski, T. Földes, M. Herman, G. Di Lonardo and L. Fusina
- "Latest results from FANTASIO+ concerning vibrational overtone excitation of van der Waals complexes", K. Didriche, C. Lauzin, T. Földes, T. Vanfleteren and M. Herman
- "Hierarchies of Intramolecular Vibration-Rotation Dynamical Processes in Acetylene up to 13,000 cm^{-1}" D. Perry, J. Martens, B. Amyay and M. Herman
- "The ab initio intermolecular potential of Ar-C_2H_2 refined using high-resolution spectroscopic data" C. Lauzin, L. Coudert, M. Herman, and J. Liévin

Leopoldina meeting, ETH Zurich, Switzerland

- "The ab initio intermolecular potential of Ar-C_2H_2 refined using high-resolution spectroscopic data" C. Lauzin, L. Coudert, M. Herman, and J. Liévin

2014

23rd International Conference on High-Resolution Molecular Spectroscopy, Bologna, Italy

- "Spectroscopic investigation of the v_1+v_2 vibrational band of the trans-formic acid at room temperature and in a free jet expansion", D. Golebiowski, T. Vanfleteren, T. Földes and M. Herman
- "High-resolution infrared spectroscopic investigation of ammonia-containing molecular complexes around 1.5 micron, T. Vanfleteren, T. Földes, and M. Herman

- "High-resolution infrared spectroscopic investigation of water-containing molecular complexes, T. Vanfleteren, T. Földes, C. Lauzin, K. Didriche, J. Liévin, and M. Herman
- "The far-infrared spectrum of $^{15}NH_3$", A. Predoï-Cross, H. Rosario, E. Canè, G. Di Lonardo, L. Fusina, and M. Herman

PAMO, Reims, France

- "Spectroscopic investigation of the v_1+v_2 vibrational band of the *trans*-formic acid at room temperature and in a free jet expansion", D. Golebiowski, T. Vanfleteren, T. Földes and M. Herman

2015

Solvay workshop on Atomic and Molecular Collision Mechanism, Brussels, Belgium

- "Complementary cavity-enhanced spectrometers to investigate the OH+CH combination band in *trans*-formic acid » D. Golebiowski, T. Vanfleteren, T. Földes, J. Liévin M. Herman, and A. Perrin
- "Investigation of $^{15}NH_3$" T. Vanfleteren, T. Földes, M. Herman, J. Vander Auwera, A. Predoï-Cross, T. Softley, G. Di Lonardo and L. Fusina.
- " 2OH overtone spectroscopy of water-containing dimers", T. Vanfleteren, T. Földes, and M. Herman

International Symposium on Molecular Spectroscopy, Urbana-Champaign, USA

- "The spectrum of $^{15}NH_3$ in the 66-2000 cm^{-1} region", A. PredoÏ-Cross, H. Rozario, M. Herman, E. Cané, L. Fusina, and D. Di Lonardo

24th Colloquium on High Resolution Molecular Spectroscopy, Dijon, France

- "Investigation of the Ar-H_2O molecular complex in the 2OH range" T. Földes, M. Herman, J. Liévin, J. Loreau, and L.H. Coudert.
- "The water dimer investigated in the 2OH overtone range using cavity-ring down spectroscopy" N. Suas-David, T. Vanfleteren, T. Foldës, S. Kassi, R. Georges, and M. Herman.
- "High resolution infrared spectroscopic investigation of ^{15}N– ammonia around 1.5 micron" T. Vanfleteren, T. Földes, A. Rizopoulos, M. Herman, J. Vander Auwera, T.P. Softley, G. Di Lonardo, and L. Fusina.
- "The infrared spectrum of $^{15}NH_3$ in the region 65-2000 cm^{-1}" A. Predoï-Cross, H. Rosario, E. Cané, L. Fusina, G. Di Lonardo, F. Tamassia, and M. Herman.
- "Unexpected van der Waals bands in the 2NH overtone spectra of ammonia" T. Vanfleteren, T. Földes, M. Herman, J. Liévin, and L. Coudert.

Quantum control of light and matte, Mount Holyoke, USA

- L. Santos, N. Iacobellis, M. Herman, D.S. Perry, M. Desouter-Lecomte, and N. Vaeck
  "Optimal laser impulsion for controlling population within the N_s=1, N_r=5 polyad of $^{12}C_2H_2$.

9. Recent international collaboration (2005-)

7a. Networks

- Laboratoire Européen Associé "HiRes" (2005-2010), FNRS (Belgium), CNRS (France) and DFG (Germany), involving the groups of Profs. T. Huet (PhLAM, Université de Lille I), J.-M. Flaud (LISA, Paris VII), W. Stahl (Universität Aachen), S. Schlemmer (Universität Köln), M. Lepère (FUNDP, Namur), and M. Herman/J. Vander Auwera (ULB, Bruxelles), http://hires.ulb.ac.be/home.htm.
- Marie Curie training European network "Quantitative spectroscopy for atmospheric and astrophysical research", QUASAAR (2005-2009), http://www.chem.uni-wuppertal.de/quasaar/.

7b. International databases

- Contribution to the international spectroscopic database "GEISA" ("Gestion et Etudes des Informations Spectroscopiques Atmosphériques", http://ara.lmd.polytechnique.fr/).
- Making of the femto-, astro-, spectro-ethyne (*FASE*) database (website under construction)

7c. Collaboration with publications (published or anticipated)

Canada

- University of Lethbridge, Department of Physics and Astronomy, Prof. A. Predoi-Cross.

France

- Universités de Paris 7 et Paris 12, Laboratoire Interuniversitaire des Systèmes Atmosphériques, Drs L. Coudert, J-M. Flaud, I. Kleiner, A. Perrin.
- Université des Sciences et Technologies (Lille I), Laboratoire PhLAM, Profs/Drs J. Demaison, T.R. Huet, G. Wlodarczak.
- Université de Montpellier 2, Institut Charles GERHARDT, Prof. C. Leforestier.
- Université de Rennes, Physique des Lasers, Atomes et Molécules, Prof. R. Georges.
- Université de Bourgogne, Institut Carnot de Bourgogne, Dr V. Boudon.
- Université Fourier de Grenoble, Groupe de spectrométrie physique, Drs A. Campargue and S. Kassi.

England

- Oxford University, department of Chemistry, Prof. T. Softley.

Italy

- Università di Bologna, Dipartimento di Chimica Fisica e Inorganica, Profs. Di Lonardo et Fusina.
- Università di Napoli (Italy), Prof. C. Di Lauro (Chimica Fisica).

Taiwan

- National Chiao Tung University, Dept. Applied Chem. and Inst. Molecular Science, Hsinchu, Prof. Y.P. Lee

USA

- Akron University, Prof. D.S. Perry.
- National Institute of Standards and Technology, Optical Technology Division, Dr. W.J. Lafferty.
- University of California at Berkeley, Prof. R.J. Saykally.

10. Principal investigator of research contracts (1990-)

8a. Belgian

- « Water molecular complexes: from laboratory towards *in situ* investigations» (2013) *Fonds Defay*
- « Spectroscopie laser ultrasensible pour la gestion de l'eau dans la ville » (2013-2014) *Prospective research for Brussels*
- « Action de Recherche Concertée (ARC) » entitled « Atomes, Molécules et Atmosphères: des Hamiltoniens quantiques aux missions satellitaires» (2008-2013) *Communauté française de Belgique*

- « Action de Recherche Concertée (ARC) » entitled « Atomes et Molécules à Haute Résolution » (2003-2007) *Communauté française de Belgique*
- « Photochimie et photophysique en phase gazeuse » (2003-2005; 2006-2011) *FNRS*
- « Contribution to the Laboratoire Européen Associé HiRES» (2003-2005; 2006-2010) *FNRS*
- « High Res » with Profs. Fayt (UCL) and Blanquet (Namur) (2002) *FNRS*
- «Etude métrologique de raies de rotation-vibration de molécules gazeuses dans le domaine de l'infra-rouge proche" (2000-2001) *FNRS*
- «Photophysique et Photochimie» (1995-1999 ; 1999-2003) *FNRS*
- «Les Vibrations Colorées» (1995-1999) *FNRS and ULB*
- « Photophysique et alchimie des vibrations colorées » (1999) *Fonds DEFAY*
- « Action de Recherche Concertée (ARC) » entitled "Les Clés Quantiques de la Réactivité» (1993-1997) *Communauté française de Belgique*
- FRFC "Analyse de spectres moléculaires complexes par double résonance et jet supersonique» with Prof. Fayt (UCL) (1992-1994) *FNRS*

8b. International

- Fondation Wiener-Anspach entitled "Ammonia collision mechanisms (ACME)" with Profs. Vaeck (ULB) and Softley (Oxford) (2012-2016).
- CGRI-FNRS-CNRS entitled "Spectroscopie intra cavité " with Dr. Kassi (Université de Grenoble) (2010-2011)
- CGRI-FNRS-CNRS entitled "Complexes hydratés " with Prof. Georges (Université de Rennes) (2007-2008)
- CEE "RTN Marie Curie" entitled « Quantitative Spectroscopy for Atmospheric and Astrophysical Research" with 10 European partners (2005-2008)
- CGRI entitled « Spectroscopie infrarouge de molécules isotopiques d'intérêt atmosphérique et interstellaire » with Prof. Di Lonardo (Università di Bologna) (2003, 2004)
- « Tournesol » entitled "Vibrations Colorées" with Dr Campargue (Université de Grenoble) (1997-2001)
- Belgian head of the « Laboratoire Européen Associé HiReS » entitled « High Resolution Molecular Spectroscopy », with 5 European partners (2000-2008)
- CEE "Network 5" entitled "Spectroscopy of Highly Excited Vibration Rotation States" (SPHERS) with 7 European partners (2000-2003)
- CEE-"Environment and Climate" entitled "Spectroscopy and Warming Potentials of Greenhouse Gases (SWAGG)" with 4 European partners (1996-1998)
- chercheur - CEE - Capital Humain et Mobilité entitled "Spectroscopy of larger Molecules (SLAM)" (1996-1998)
- NATO entitled "Highly Excited Vibrations : Spectroscopy and Dynamics in the Gas Phase" with Prof. Snavely (Bowling Green, Ohio, USA) (1995-1997)
- NATO for a workshop entitled "Overtone Spectroscopy and Dynamics" (1994).
- CEE - Human capital and mobility entitled "Spectroscopy of larger Molecules (SLAM)" (1994-1996)
- Coordinator -CEE-SCIENCE, entitled "Spectroscopy and Dynamics of vibrationally excited molecules" with 6 European partners (1991-1994)
- CEE entitled "Science and Technology for Environment Protection (STEP) : Infrared Spectroscopy of Ozone and Related Atmospheric Constituents (ISORAC)" with 7 European partners (1991-1994)
- European project EUROTRAC - JETDLAG, (« Services de Programmation de la Politique Scientifique ») (1989-1993)

8c. Supervision of contractual researchers (postdocs)

- Dr. Y. Kabbadj (Université Libre de Bruxelles), 1989-1990 (24 months)

- Dr. J. Holland (University of Reading), 1991-1992 (12 months)
- Dr. F. Mélen (Université de Liège), 1990-1992 (24 months)
- Dr. J.M. Guilmot (Université Libre de Bruxelles), 1993 (4 months)
- Dr. A. Held (Université de Pittsburgh), 1994 (12 months)
- Dr. G. Durry (Université de Paris Sud), 1994-1995 (7 months)
- Dr. R. Georges (Centre National des Champs Intenses, Grenoble), 1994-1997 (27 months)
- Dr. M. Hepp (Universität zu Koln), 1996-1998 (24 months)
- Dr. D. Hurtmans (ULB), 1998-2001 (36 months)
- Dr. S. Kassi (Université de Lille), 2000-2001 (18 months)
- Dr. P. Macko (Université de Bratislava), 2005 (12 months)
- Dr. K. Didriche (ULB), 2010-2013 (48 months)
- Dr. T. Földes (Bratislava), 2010-2015 (72 months)

11. ULB research group HiReS 2012-2016

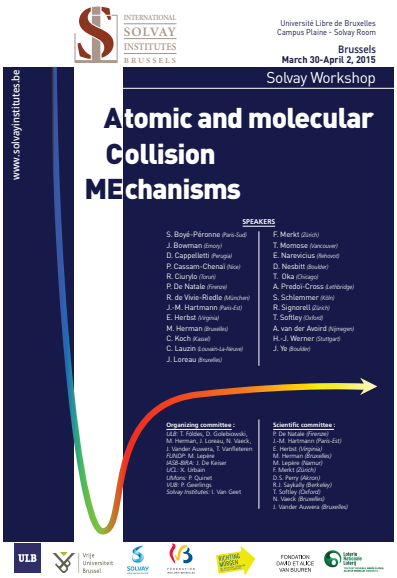
9a Research group

- Dr. Keevin DIDRICHE, « Chargé de recherches F.R.S.-FNRS »
- Dr. Tomas FÖLDES, "Postdoc"
- Dr. Clément LAUZIN, PhD student "Assistant ULB" (Chemistry)
- Badr AMYAY, PhD student (Physics)
- Xavier de GHELLINCK d'ELSEGHEM VAERNEWIJCK, PhD student (Engineering)
- Darius GOLEBIOWSKI, PhD student (Chemistry)
- Thomas VANFLETEREN, PhD student (Chemistry)
- Sélim KIZIL, research engineer on contract (F.R.S.-FNRS)
- Atina RIZOPOULOS, research engineer (ULB)
- Patrick VAN POUCKE, mechanics (ULB)

9b Large equipment available

- High resolution Fourier transform interferometer (Bruker IFS120HR)
- Supersonic jet expansion (home made) with 2 turbomolecular pumps (Leyboldt MAG W 3200 CT)
- Gas/liquid injection systems heated (CEM Gefran) and pulsed (Pulsed Valve)
- Array of DFB lasers around 1.5 microns
- Femtosecond laser and OPO module (Coherent, CHAMELEON Ultra II)
- Pump laser (Coherent Verdi 18W)
- Cavity enhanced and cavity ring down spectroscopy cells and accessories, coupled to the supersonic expansion.
- Quadrupole mass spectrometer (HIDEN RC Peak Analyser HPR30, 1-510 amu)
- Home made portable cavity ring down spectrometer for *in situ* detection

*The running commercial equipment has required over 1 MEuros acquisition budget over recent years. It was commented in 2011 by an international panel of experts auditing research at the ULB chemistry department as: "**Superb experimental facilities. Successfully competes with the best teams in Europe, Japan and USA (including MIT and Berkeley)".***



Posters of the recent Solvay workshops organized by the research group (2010, 2012 and 2015).